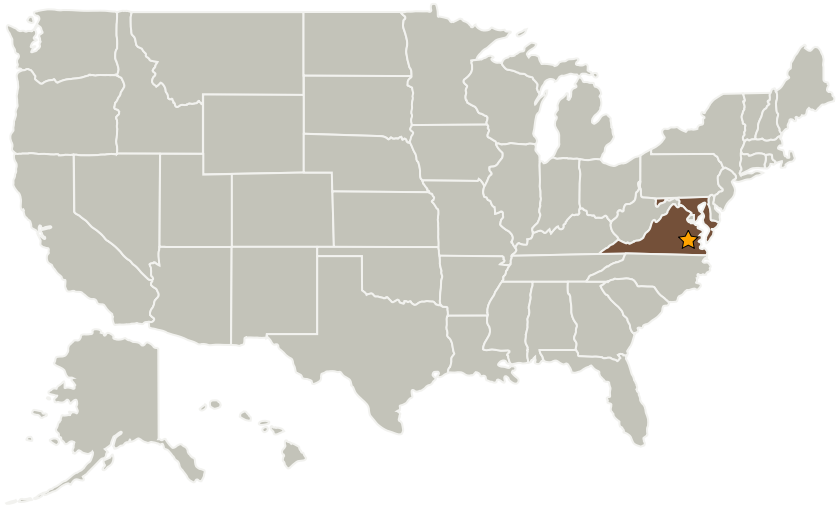
Flight Crew State Monitoring Metrics, Phase I

Completed Technology Project (2009 - 2009)

Project Introduction

eSky will develop specific crew state metrics based on the timeliness, tempo and accuracy of pilot inputs required by the H-mode Flight Control System (HFCS). Specific scenarios will be developed which define required inputs by the pilot and metrics of timeliness, tempo and accuracy will be developed for each required input. An existing HFCS simulator will be enhanced to support the full scenarios and crew state metric capture. Human subject testing will validate the stability of the metrics in normal situations and the responsiveness of the metrics to crew state degradation due to high workload. Strategies for continuous real-time function allocation to crew and automation will be developed. At the end of phase 1 crew state monitoring metrics will be at TRL 4/5. In phase 2 we will incorporate these metrics and strategies into the HFCS simulator and evaluate the usability and validity of these metrics and strategies using both workload and hypoxia as means of controlled crew state degradation. At the end of phase 2 metric-based function reallocation will be implemented in a collaborative flight control system ready for incorporation into a full motion simulator at TRL 5.

Primary U.S. Work Locations and Key Partners



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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Langley Research Center (LaRC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
★Langley Research Center(LaRC)	Lead Organization	NASA Center	Hampton, Virginia
Emerald Sky Technologies, LLC	Supporting Organization	Industry	Columbia, Maryland

Primary U.S. Work Locations	
Maryland	Virginia

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Technology Areas

Primary:

- TX06 Human Health, Life Support, and Habitation Systems
  - TX06.3 Human Health and Performance
    - TX06.3.3 Behavioral Health and Performance